Question 4

a) The 10 tosses are independent, and the probability that a head comes up is 50%. Therefore, the expected value of X is $\sum$ p*r = 0.5*10 = 5
b) Using the same logic as above, except adjusting the probability to 60%. The expected value of X is now 0.6*10 = 6

Question 5

There are 5 vowels and 21 consonants. Each round is independent, meaning we can use the product rule to multiply the expected value of one round's point by n.

Expected value of points is the probability-weighted sum of each round's point: 3*(21/26) – 1*(5/26) ~= 2.23.

The final answer is therefore 2.23*n.

Question 6

The expected number of tails is the same as the expected number of heads, both 50%*n. Therefore, expected value of Xn is then 50%*n – 50%*n = 0.